



Academic Press Dictionary of Science and Technology

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polar vortex *Meteorology*. the large-scale cyclonic circulation at the mid- and upper-tropospheric layer centered mainly over the polar regions; characterized by a two-center vortex, one near Baffin Island and the other over northeast Siberia. Also, POLAR CYCLONE, POLAR LOW.

polar wandering *Geology*. the movement of the earth's rotation poles and magnetic poles over geologic time. Also, CHANDLER MOTION, POLAR MIGRATION.

polC gene see DNAE GENE.

polder *Civil Engineering*. 1. the reclamation, encompassing, and draining of lands taken from the sea by means of dikes, as in the Netherlands. 2. an area of land reclaimed in this way.

pole *Mechanics*. the point at which the axis of rotation or symmetry of a body passes through its surface. *Astronomy*. 1. either of two such points on the surface of the earth; the North Pole or South Pole. 2. either of two similar points in the heavens about which the stars seem to revolve. *Physics*. one of two points, parts, or regions that have opposing qualities or tendencies, such as the ends of a magnet, the electrodes of an electrolytic cell, or the terminals of a battery. *Biology*. either end of the axis of a nucleus, cell, organ, or complete organism, about which the parts seem to be symmetrically arranged. *Cell Biology*. 1. specifically, either end of the spindle formed in a cell during mitosis. 2. the point in a cell where a process or extension originates. *Electricity*. an output terminal as part of a switch, or two output terminals as part of a double-pole switch. *Optics*. 1. either of the points on the extremities of the lens axis at the position where the axis intersects with the lens surfaces. 2. the geometric center of a convex or concave mirror. *Crystallography*. an orientation direction perpendicular to a face of a crystal.

pole *Mathematics*. 1. let $f(z)$ be a function of a complex variable that is analytic in a simply connected domain D , except at a point z_0 . If there exists a positive integer k such that $(z - z_0)^k f(z)$ is analytic at z_0 , then z_0 is said to be a pole of $f(z)$. The smallest such positive integer k is called the order of the pole. 2. let Γ be a conic in the plane and l a line intersecting Γ in at most two points, at which points tangents to Γ are drawn. The point P external to Γ at which the tangents intersect is the pole of l with respect to Γ , and l is the polar of P with respect to Γ . If l is tangent to the conic, then P is the point of tangency to Γ . If l lies outside the conic, then choose any two points M and N on l and find their polars m and n . Then the pole P for l is the point of intersection of the lines m and n . Again, l is the polar for P .

pole blight *Plant Pathology*. a fatal disease of white pines, characterized by stunting of new growth, yellowing or shortening of needles, and excess resin flow.

polecat *Vertebrate Zoology*. 1. a small, carnivorous, dark-brown mammal, *Mustela putorius*, of the weasel family, that ejects a fetid fluid when disturbed; found in Europe. 2. another name for the North American skunk.



polecat

pole cell *Invertebrate Zoology*. a cleavage cell of various insect embryos.

pole changing control *Electromagnetism*. a method of obtaining two or more running speeds of a three-phase motor by changing the number of magnetic poles.

pole-dipole array *Engineering*. an arrangement of electrodes used in a drill logging or surveying process, in which one current electrode is set at infinity while others are guided across the structure to be studied.

pole dominance *Particle Physics*. a scattering amplitude property in which, in the complex analysis of the energy and scattering angle, the dominating terms of the Laurent series near a pole are those terms with negative powers.

pole face *Electromagnetism*. the smooth face of a permanent magnet or a magnetic core that faces an air gap.

pole-face winding *Electromagnetism*. winding in the pole face of a motor or generator; used to neutralize the cross-magnetizing armature reaction under the pole faces.

pole figure *Metallurgy*. a graphic representation of the preferential orientation of a polycrystalline metal or alloy.

Polemoniaceae *Botany*. a family of dicotyledonous plants in the order Solanaceae, characterized by regular flowers with three carpels, gland-tipped hairs, a continuous xylem ring, and no internal phloem.

Polemoniales see SOLANALES.

pole piece *Electromagnetism*. a piece of ferromagnetic material at the end of an electromagnet or permanent magnet, whose shape controls the magnetic flux distribution.

pole-pole array *Engineering*. an arrangement of electrodes, used in a logging or lateral search process, in which one current electrode and one potential electrode are moved in proximity across the structure to be studied.

pole-positioning *Control Systems*. in linear control theory, a design technique that relies on the proper choice of a linear feedback law to position any or all of a system's closed loop poles.

polestar *Astronomy*. see POLARIS.

polestar recorder *Engineering*. a device used to determine the degree of cloudiness during night and early morning darkness; it is made up of a camera that keeps the polestar (Polaris) in constant view, recording the clouds that come between it and the star.

Pole-tek test *Materials Science*. a commercial testing process for non-destructive evaluation of wood that uses sound velocity to determine the presence of decay by comparison with the velocity of a standard, decay-free pole.

pole tide *Oceanography*. a tide caused by the Chandler wobble of the earth, a nutation that has a period of 428 days and a theoretical amplitude of 6 mm.

pole-zero configuration *Control Systems*. a method of analyzing a system for stability, natural motion, frequency response, and transient response by plotting the poles and zeros of its transfer function in the complex plane.

polhode *Mechanics*. for a rotating rigid body of arbitrary shape subjected to no forces other than its own weight and the reaction of the support at its center of mass, the curve traced by the tip of its angular velocity vector with respect to a frame of reference coinciding with its principal axes of inertia.

Polhode cone see BODY CONE.

poli- or polio- a combining form meaning "gray," especially the gray matter of the brain.

polian vesicle *Invertebrate Zoology*. an elongate muscular sac suspended from the ring canal in echinoids and holothurians; used in maintaining pressure in the organism's water vascular system.

poling *Electricity*. the deliberate adjustment of an electromagnetic field polarity, especially in wire-line applications in which transpositions are used between sections of wire or lengths of cable to allow the opposition of residual cross-talk couplings in individual sections or lengths. *Metallurgy*. a reducing step in the refining of copper, formerly effected by immersing a green pole into the molten crude copper; currently effected by using a reducing gas such as propane.

polio *Medicine*. a shorter name for the disease poliomyelitis. See POLIOMYELITIS.

polioencephalitis *Neurology*. inflammation of the gray matter of the brain and brain stem.

polioencephalomyelitis *Medicine*. an inflammatory disease of the gray matter of the brain and spinal cord.

poliomyelitis [pō'lē ō mī'ə lī'tās; pō'lē ō mī lī'tās] *Medicine*. an acute viral disease, occurring sporadically and in epidemics, characterized in the minor illness by fever, sore throat, headache, stiff neck and back, and vomiting. The major illness is characterized by involvement of the central nervous system, with possible paralysis and atrophy of muscles or muscle groups resulting in permanent deformity. The disease is now largely controlled by vaccines. Also, POLIO, INFANTILE PARALYSIS.